



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,360	01/05/2004	Jin-Woo Park	062020-1380	2196

24504 7590 07/27/2005

THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP  
100 GALLERIA PARKWAY, NW  
STE 1750  
ATLANTA, GA 30339-5948

EXAMINER

TUGBANG, ANTHONY D

ART UNIT	PAPER NUMBER
----------	--------------

3729

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

70

<b>Office Action Summary</b>	Application No. 10/751,360	Applicant(s) PARK ET AL.	
	Examiner A. Dexter Tugbang	Art Unit 3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 10-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/25/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of the invention of Group I, Claims 1-9, in the reply filed on 5/9/05 is acknowledged. The traversal is on the ground(s) that all of the inventions can be searched without serious burden. This is not found persuasive because the searches for all of the inventions of Groups I through IV would be non-coextensive, as this would require a serious burden on the examiner to search and examine all of the invention.

The applicant(s) further argue that the invention of Groups I and III are not independent and distinct. The examiner most respectfully disagrees. In addition to each of these inventions belonging to different statutory classes inventions, i.e. (Class 336 - structures of inductors and Class 29 - process of making inductors), the product of Group III can be made by a materially different process, such as the screen printing process mentioned in the last Office Action, or by metal casting or molding techniques that require no deposition, as required by Group I. This material difference presents two distinct lines of patentability between the inventions of Group I and III and would even require the application of different art and different case law. These factors are also taken into consideration as to why the searches would present a severe burden on the examiner.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 10-25 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 5/9/05.

### ***Specification***

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because the use of already implied language, i.e. "...are disclosed" (line 3 of page 19 in the specification). Correction is required. See MPEP § 608.01(b).

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: A Method for Manufacturing an Inductor Core.

### ***Claim Objections***

6. Claim 8 is objected to because of the following informalities: "the order" (line 2) should be recited as --an order--; and "the skin depth" (line 2) should be recited as --a skin depth--. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 3729

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

8. Claims 2-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 2, the phrase of “the depositing” (line 1) is confusing and misleading rendering the claim as being vague and indefinite. For example, there are at least three different depositing steps previously recited (lines 3-5 of Claim 1) and it is unclear which of these previous steps are being referred to, or are all of the steps being referred to.

In Claim 4, the same problem occurs with the recitation of “the deposited materials” (lines 2-3) as with Claim 2 in that it is unclear as to which previous materials (at lines 3-5 of Claim 1) are being referred to.

### ***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 5 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al 5,283,942.

Chen discloses a method of manufacturing an inductor core (see sequence of Figs. 8A through 8F) comprising: depositing a first layer of ferromagnetic material 44; depositing a first layer of sacrificial conductive material 48; depositing a support structure (insulating layer 52);

Art Unit: 3729

and removing the sacrificial conductive material thereby leaving the first layer of ferromagnetic material mechanically supported by the support structure (see sequence of Figs. 8D to 8E).

Regarding Claim(s) 5, the support structure (insulating layer 52) of Chen is considered to be U-shaped (in Fig. 8C).

Regarding Claim(s) 7, the sacrificial conductive material 48 is copper (see col. 5, lines 55-58).

Regarding Claim(s) 8, the inductor core of Chen has an inherent operating frequency and the thickness of the first layer of ferromagnetic material 44 (shown in Fig. 8F) is on an order of a skin depth of the material at that operating frequency.

Regarding Claim(s) 9, Chen further teaches removing the sacrificial conductive material by selective etching (see col. 5, lines 55-64).

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 2-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al.

Chen discloses the claimed manufacturing method further including creating a core mold (photoresist layer not shown, discussed at col. 5, lines 65+) atop a substrate where the core mold (photoresist layer) is shaped such that deposited materials of the first ferromagnetic material and

Art Unit: 3729

the first sacrificial conductive material 48 are formed in a preferable manner (result shown in Fig. 8B), as required in Claim 4. Chen further teaches that the first layer of ferromagnetic material and the first layer of sacrificial conductive material are each deposited in a repetitive and stacked manner, as required in Claim 3.

Chen discloses substantially all of the limitations of the claimed manufacturing method except: 1) that the deposition of the first layer of ferromagnetic material and the first layer of sacrificial conductive material is performed by electrodeposition; 2) that the support structure is deposited by electrodeposition; and 3) that the first layer of ferromagnetic material is permalloy.

The examiner takes Official Notice that electrodepositing layers of ferromagnetic materials, sacrificial conductive materials of copper, and support structures of  $\text{Al}_2\text{O}_3$ , are all conventional, old, and notoriously well known coating techniques in the art, all of which are necessary to achieve a certain pattern and thickness of the layered materials. As evidence of obviousness, the examiner cites Croll (U. S. Patent 3,350,180) to show examples that ferromagnetic materials and sacrificial conductive materials of copper can be formed by electrodeposition. The examiner also cites Japanese Patent Publication JP 64-47880, to show that support structures of  $\text{Al}_2\text{O}_3$  can also be formed by electrodeposition of chemical vapor deposition.

With respect to the first layer of ferromagnetic material being permalloy, the examiner again takes Official Notice that this is an old, conventional, and notoriously well known material for ferromagnetic materials. As evidence of obviousness, the examiner notes that Chen has another embodiment that suggests ferromagnetic materials can be formed of the conventional material of permalloy (see col. 6, lines 47-51).

Art Unit: 3729

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Chen by electrodepositing the ferromagnetic materials, sacrificial conductive materials, and support structures, as well as using permalloy as the material of the first layer of ferromagnetic material, since these are conventional and well known coating techniques and materials, all of which positively contribute to the patterning and thickness of the layered materials.

### *Conclusion*

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

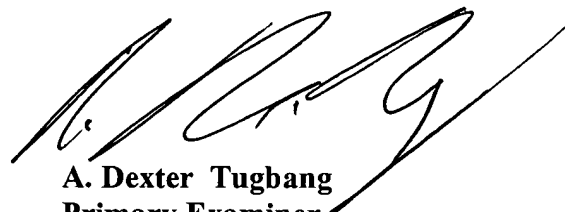
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 571-272-4570. The examiner can normally be reached on Monday - Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Art Unit: 3729

A handwritten signature in black ink, appearing to read 'A. Dexter Tugbang', written over the printed name.

**A. Dexter Tugbang**  
**Primary Examiner**  
**Art Unit 3729**

July 24, 2005